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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **LIGHT INDUCED IMMOBILISATION**

(57) Abstract: The present invention involves a method of coupling disulfide bridge containing proteins to a carrier by inducing the formation of thiol groups on a protein with irradiation, and coupling the protein to the carrier. The formation of thiol group(s) in the protein is a consequence of the disruption of disulfide bridges following electronic excitation of aromatic amino acid residues located in close spacial proximity to the disulfide bridge. The light-induced coupling method facilitates the orientated immobilization of a protein on a carrier.



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INTERNATIONAL SEARCH REPORT

In tional Application No
PCT/DK2004/000047

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K17/00 G01N33/68 C12N11/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K G01N C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, BIOSIS, PAJ, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 91/16425 A (SIGRIST HANS ;KLINGLER DABRAL VIBHUTI (DE); DOLDER MAX (CH); WEGMU) 31 October 1991 (1991-10-31) cited in the application the entire document, in particular claims 1 to 6 and pages 2,3 and 5	1-27
X	WO 94/01773 A (BIOMIRA INC ; QI PEI (CA); SYKES THOMAS R (CA); WOO THOMAS K (CA); NOU) 20 January 1994 (1994-01-20) the entire document, in particular pages 1,11,19 and claim 1	1-27

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
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- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

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- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- * & * document member of the same patent family

Date of the actual completion of the international search

13 July 2004

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INTERNATIONAL SEARCH REPORT

In International Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	COLLIOUD A ET AL: "ORIENTED AND COVALENT IMMOBILIZATION OF TARGET MOLECULES TO SOLID SUPPORTS: SYNTHESIS AND APPLICATION OF A LIGHT-ACTIVATABLE AND THIOL-REACTIVE CROSS-LINKING REAGENT" BIOCONJUGATE CHEMISTRY, AMERICAN CHEMICAL SOCIETY, WASHINGTON, US, vol. 4, no. 6, 1993, pages 528-536, XP001121631 ISSN: 1043-1802 cited in the application abstract; figure 1	1-27
X	NEVES-PETERSEN MT ET AL.: "High probability of disrupting a disulphide bridge mediated by an endogenous excited tryptophan residue" PROTEIN SCIENCE, vol. 11, 2002, pages 588-600, XP002288112 cited in the application the entire document, in particular section "Discussion" and the abstract	28,29
A	US 6 350 368 B1 (WILMER I ET AL.) 26 February 2002 (2002-02-26) the whole document	
A	US 3 959 078 A (GUIRE PATRICK E) 25 May 1976 (1976-05-25) page 1 - page 2; claim 1	
A	US 5 412 087 A (MCGALL GH ET AL) 2 May 1995 (1995-05-02) column 3; example 3	
A	DOSE K: "The Photolysis of Free Cystine in the Presence of Aromatic Amino Acids" PHOTOCHEMISTRY AND PHOTOBIOLOGY, vol. 8, 1968, pages 331-335, XP008032773 the entire document, in particular page 331 and Figure 1	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK2004/000047

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-27 (all completely)

methods of coupling a disulfide bridge containing protein or peptide to a carrier

2. claims: 28,29 (both completely)

method of predicting a disulfide bridge containing protein or peptide capable of disruption by irradiation

INTERNATIONAL SEARCH REPORT

Information on patent family members

In tional Application No

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